

LONG ISLAND BOTANICAL SOCIETY NEWSLETTER

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The Grandifolia Sandhills: One of Long Island's Great Natural Wonders

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Illustrated by Audrey Watson Wigley

Have you ever heard of the "Grandifolia Sandhills"? There is a good chance that this is the first time you've heard these words. But while the name is new, this unique natural area has been known to geologists, botanists and naturalists for more than 120 years.

The Grandifolia Sandhills is a globally rare ecosystem located on and adjacent to the Riverhead Bluffs overlooking Long Island Sound, approximately 4 miles northwest of downtown Riverhead. A dwarf form of American beech (*Fagus grandifolia*) dominates portions of the enormous sand dunes towering 180 feet above sea level.

In 1997 Frederick C. Schlauch formally named this endangered natural area the Grandifolia Sandhills, combining the species name of the American beech with the massive dune formations that characterize the region's geology. Schlauch is also the biologist who first named, defined and mapped the "Dwarf Pine Plains" of Long Island (Schlauch 1977); he also defined and mapped the "Oak Brush Plains" and raised public awareness of the Long Island Pine Barrens as a whole to a level of understanding and concern far above any that had existed before.

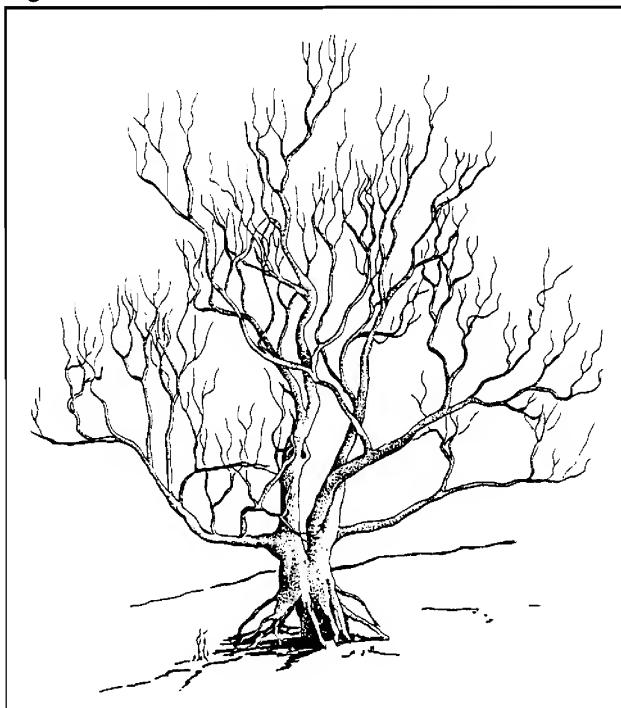
Historical Background

Over the last century and a quarter, several publications and documents have referred to the region now known as the Grandifolia Sandhills. Geologist Elias Lewis, Jr. published in 1876 a

detailed account of the sand dunes and dune formation processes of Long Island, and provided specific information on the massive movement of sand dunes at a farm near Baiting Hollow, north of Riverhead. Apparently, Lewis was the first individual to refer to the region as "sand-hills."

In his landmark publication, *The Geology of Long Island, New York*, Myron L. Fuller (1914) extensively discussed the sand dunes along and southward from the Riverhead Bluffs bordering Long Island Sound. So impressed was Fuller by the unique geology of the Grandifolia Sandhills that in his book he devoted a full page plate to photographs of sand dunes "capping the tops of the bluffs" in the vicinity of Friars Head.

Long Island's premier naturalist, Roy Latham, recorded in his *Journal* numerous visits to "the very high sand dunes west of Reeves Lane towards



Century old dwarf beech trees at the Grandifolia Sandhills are often multi-stemmed and less than 12 feet tall.

Baiting Hollow," where he collected rare insects, plants, and Indian artifacts. Latham also noted the area to be a significant migratory pathway for neotropical bird species as well as a vantage point for viewing hawk migrations.

In 1970, Ralph E. Good and Norma F. Good published a significant paper on the vegetation of a portion of the Grandifolia Sandhills; they detailed the development of a "pygmy beech forest" on the sea cliffs and adjacent sand dunes at the north end of Friars Head Farm. Good and Good described a pristine area that had never been farmed, with trees up to 120 years old; they concluded that the forest "constitutes one of the larger areas of mature natural vegetation on the north shore of Long Island." Andrew Grelle (1977) noted that the "Dwarf Beech Forest described by Good and Good is unknown elsewhere on the island."

In 1994, New York State Department of State, Division of Coastal Resources, stated: "portions of the Riverhead Bluffs around Friars Head are covered by a maritime beech forest, a unique plant community on the Sound considered by the NYS Natural Heritage Program to be globally rare. It is one of three known maritime beech forests in New York (and in size, the largest, by far), and one of three known along the east coast. The true extent of the maritime beech forest is not known, but it may stretch beyond the immediate area of Friars Head."

Several small, disjunct occurrences of the dwarf beech forest have been located and described by Mary Laura Lamont (1994). One site occurs at Wildwood State Park, approximately 3 miles west of the Grandifolia Sandhills; another site is located approximately 2.5 miles east of the Sandhills.

Before 1997, there was no clear definition or delineation of the lands comprising the Grandifolia Sandhills. Included within the ecosystem are the lands covered by the vegetation study of Good and Good (1970) who gave the size of their "study zone" as approximately 140 acres. It should be emphasized that Good and Good were not trying to map the entire Grandifolia Sandhills; their study did not include the goal of defining the Sandhills as an ecosystem.

In 1997, Schlauch prepared a preliminary map defining the boundaries of the Grandifolia Sandhills. Included within the ecosystem are the areas previ-

ously referred to as the "Dwarf Beech Forest" and the "Maritime Beech Forest," on and near Friars Head in the Town of Riverhead. Some less extensive successional plant communities were also included within the ecosystem. Schlauch included approximately 250 acres within the Grandifolia Sandhills, but noted that his map was only preliminary and did not necessarily include all of the lands comprising the Sandhills. I have studied Schlauch's map. Based on my own field work I conclude that the ecosystem definition and delineation presented by Schlauch (1997a, 1997b) are by far the most scientifically comprehensive and the best yet offered.

The Grandifolia Sandhills is an ecosystem clearly worth being preserved. But if the Sandhills is to survive, the integrity of the natural geologic and biotic forces and features forming this great natural wonder must be preserved as a whole.

Geology

In 1876, Elias Lewis, Jr. published an intriguing description of the region now known as the Grandifolia Sandhills. Many of the natural forces and landscape features described by Lewis can still be observed today. Lewis wrote:

"On the north side of Long Island, upon the banks along the Sound, are a great number of sand-hills from twenty to eighty feet high. . . . In some places they advance slowly inland. A farm, near the village of Baiting Hollow, in Suffolk County, has lost from this cause thirty acres in half a century. Other farms have lost valuable land in a similar way, and we are informed that, during the time mentioned, 100 acres of arable and timber land have been inundated, and are now deeply covered with drifting sand in this immediate neighborhood. At this point is the great dune known on the Coast Survey charts as Friar's Head. Its top is 150 feet above tide, but it stands on the bank which is half that height, so that 75 feet of that elevation is drifting sand. It was originally formed many yards inland, as others are continually forming, but, by the ceaseless wearing away of the bluffs, it is now upon their brink. It is evidently of considerable age, as its windward slope is covered by a thick growth of beach-

grass, bayberry and other bushes, with stunted trees of beech and cedar quite at its top.

"From this point the weird architecture of the sand-hills is singularly impressive. There is formed, to the southeast of Friar's Head, a great semicircle of sand, between which and the dune is a floor of several acres in extent swept by the winds. This floor, the original surface of the drift now laid bare, is rich in the remains of an old Indian settlement. Hundreds of specimens — including arrow-heads of flint, jasper, and quartz, axes of various sizes, and other articles of utility — have been picked up.

"The sand blown from this spot and from the flanks of the dune constitutes the semicircular wall spoken of. It is one-eighth of a mile inland, and lies directly against a forest of oak and pine, burying many of the trees to a height of thirty to forty feet, only their dead and barkless tops being visible. On the surface of these sands beach-grass of several kinds, and young pine-trees (*Pinus rigida*) maintain a doubtful struggle for life. . . . The present forests may delay, but cannot arrest, the final inundation of the land where the sand-hills crown the coast."

Further elaboration of these natural geologic features has been provided by Schlauch (1997a), from whose copyrighted letter I quote with permission:

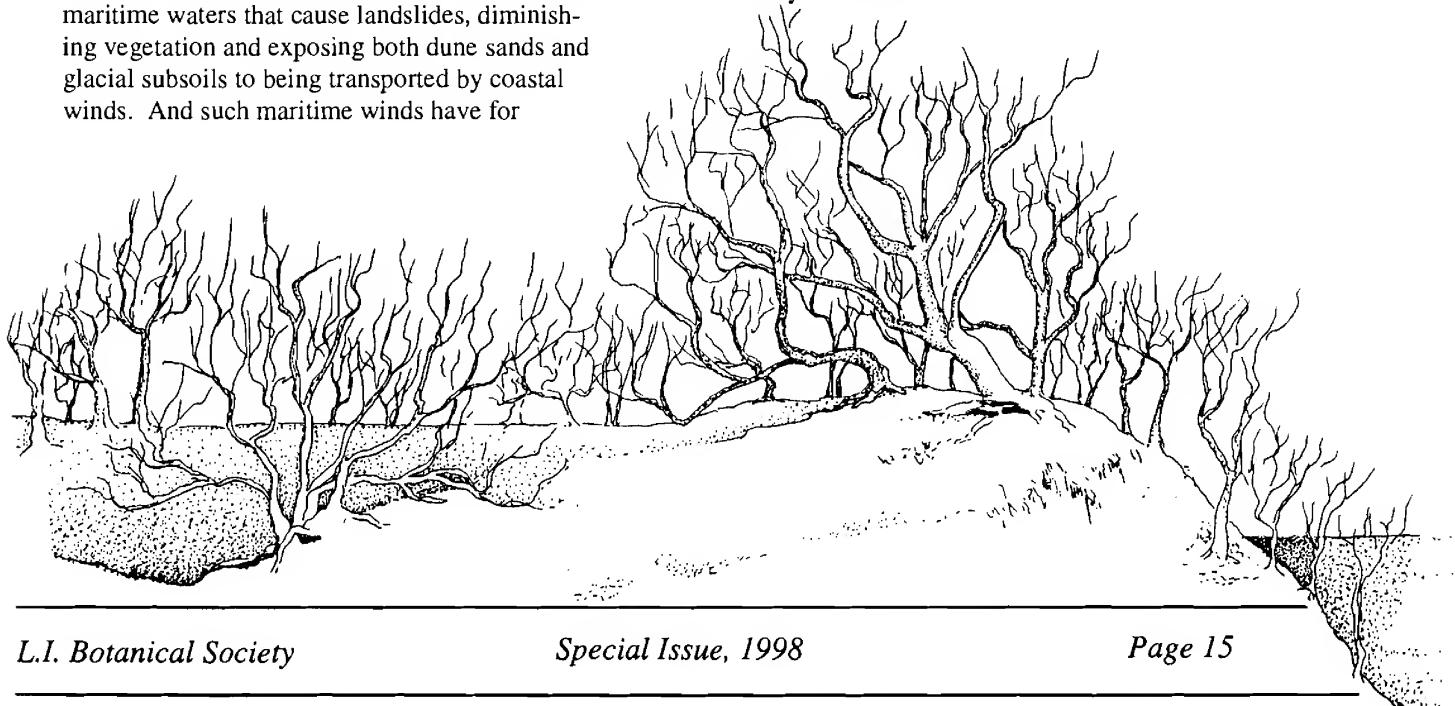
"The Grandifolia Sandhills is a biogeographic region that was and is being formed and modified by dynamic coastal forces. The Long Island Sound bluffs along the northerly edge of the Grandifolia Sandhills are eroded by undercutting maritime waters that cause landslides, diminishing vegetation and exposing both dune sands and glacial subsoils to being transported by coastal winds. And such maritime winds have for

centuries, if not millennia, blown huge quantities of sands from these exposed and ever naturally receding bluffs to the above uplands. The winds blow and move the sands, forming the great coastal dunes that today dominate the fragile Grandifolia Sandhills landscape.

"The geological literature supports the belief that massive movement of coastal dunes occurred in the 19th Century. The existence of coastal dune formations in parts of the Grandifolia Sandhills more than one-half mile from the Long Island Sound is undoubtedly a product of such massive dune movements, perhaps in whole or part comprising some of the awesome dune migrations described by geologist Elias Lewis, Jr., for the previous century.

"Although natural vegetation has stabilized most of the dunes, there are substantial areas of bare sands being subjected to and moved about by maritime winds in such sections of the Grandifolia Sandhills as the Friars Head Blowout and the DeFriest Blowout. And new dune formation is even now occurring along the edges of the Long Island Sound bluffs. The Grandifolia Sandhills is indeed a region formed and being formed by dynamic coastal forces."

Many basic questions concerning the region's geology remain unanswered; but one thing is certain: The dunes of the Grandifolia Sandhills are massive and dwarf the dunes typical of Long Island beaches. With a length of about 1.25 miles and a maximum width of about 0.5 mile, and with its dunelands known to science for over 120 years, the Grandifolia Sandhills is certainly not an ecosystem easily overlooked.



Plant Communities

At least five distinct but interrelated plant communities occur at the Grandifolia Sandhills: 1) Maritime Dwarf Beech Forest, 2) Coastal Beech Forest, 3) Maritime Dunes, 4) Pitch Pine-Oak Duneland, and 5) Maritime Shrubland. The first four communities are rare occurrences in New York.

To fully appreciate the significance of the Grandifolia Sandhills ecosystem, an introductory note on the biology of American beech (*Fagus grandifolia*) is in order. The smooth, tight, steel-gray bark of this species, together with the distinctive lance-shaped winter buds make this a well known and easily recognized tree even in winter. The species thrives on rich upland soils, but also occurs on moist or wet lowland soils especially in the southeastern states (Gleason and Cronquist, 1991). The trunk is usually single, and mature trees reach a height of 70 to 100 feet. The reproductive biology of American beech is especially noteworthy, and may play a significant role in the success of the species at the Grandifolia Sandhills. Sexual reproduction resulting in the production of beech nuts is relatively uncommon; asexual reproduction via clone production is common. Colonies of dwarf beech trees on the seaside bluffs probably constitute a single persistently, organically connected clone.

Maritime Dwarf Beech Forest. Occurs on the bluff face, on the bluff top, and on dune ridges. This unique plant community is considered to be globally rare (New York State Department of State, 1994). The dominant species is a dwarf form of American beech; mature individuals are stunted (usually less than 12 feet tall), often multi-stemmed from the base, and extremely gnarled and contorted. Century old trees often grow horizontally before sending twisted limbs skyward, only to be pruned back by constant exposure to salt spray, sand blow-up, cold wind, and winter ice. Other species associated with the dwarf beech include red maple (*Acer rubrum*), hickory (*Carya glabra* and *C. tomentosa*), black oak (*Quercus velutina*), and shadbush (*Amelanchier canadensis*). In 1998, I used an increment borer to determine the age of one of the old dwarf beech trees as 138 years.

Coastal Beech Forest. Occurs throughout the protected depressions of the undulating duneland south of the bluffs. Nowhere else in New York does such a mature climax forest occur on sand dunes. The big surprise to Long Island botanists is the occurrence of sugar maple (*Acer saccharum*) growing wild among the beech trees. Elihu S. Miller, coauthor of the only published flora of Suffolk County, first reported sugar maple from Baiting Hollow in the late 1800's (Peters, 1973). Roy Latham reported a grove of Canada hemlock (*Tsuga canadensis*) from the vicinity of the Grandifolia Sandhills (Peters, 1973). Sugar maple and Canada hemlock are both cool climate trees that are rare on Long Island.

Maritime Dunes. Occurs on active sand dunes that reflect past disturbances resulting in sand movement; large areas of this early successional community are present at the Friars Head Blowout and the DeFriest Blowout. Good and Good (1970) reported that the average plant cover in these two blowouts was only 10% with bare sand (89%) and litter (1%) completing the total. Beachgrass (*Ammophila breviligulata*), broomsedge (*Andropogon virginicus*), and beach heather (*Hudsonia tomentosa*) are characteristic species of these active dunes. New York Natural Heritage Program lists this community as rare in New York (Reschke, 1990).

Pitch Pine-Oak Duneland. Occurs on recently stabilized sand dunes. Some of the dune-lands associated with blowouts are dominated by an unusual growth form of pitch pine (*Pinus rigida*), in which the lower branches surrounding the upright trunk grow out horizontally over the sand like a blanket. Other trees occurring with the pines include black oak and wild cherry (*Prunus serotina*). This plant community also occurs at "The Walking Dunes" region of Hither Hills State Park just east of Napeague Harbor. The ecology of this plant community has been described in detail by Johnson (1981, 1985). New York Natural Heritage Program lists this community as rare in New York (Hunt, pers. comm.).

Maritime Shrubland. Occurs on seaside bluffs and dunelands that are exposed to offshore winds and salt spray. This is a relatively low diversity community dominated by black huckleberry (*Gaylussacia baccata*), bayberry (*Myrica pensylvanica*), beach plum (*Prunus maritima*), and lowbush blueberry (*Vaccinium pallidum*). This community also occurs on Fire Island and at the Montauk Moorlands.

Rare Plants

To my knowledge a systematic survey for rare plants at the Grandifolia Sandhills has never been conducted by a qualified botanist. The site does provide suitable habitat for several rare plant species previously collected from the general vicinity.

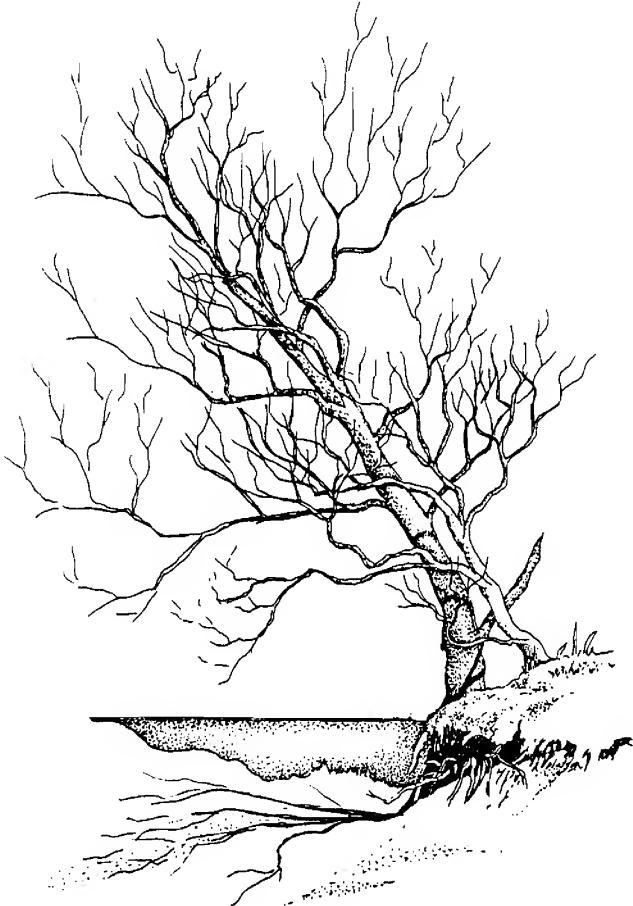
Historically, seventeen rare plant species have been reported by New York Natural Heritage Program from the "vicinity of Friars Head" (Young, pers. comm.); eleven of the species have not been observed since the late 1800s (designated in the list below by an asterisk [*]). All 17 species are documented in herbaria by voucher specimens. Several of the species are of southern affinities and reach their northern range limit on Long Island. The 17 species, all of which occur in dry sandy soil of upland woods, barrens, or open places, are as follows:

- **Asclepias variegata*, white milkweed
- Aster concolor*, silvery aster
- **A. pilosus* var. *pringlei*, heath aster
- **A. solidagineus*, flax-leaf aster
- **Cunila origanoides*, dittany
- **Eupatorium aromaticum*, small white snakeroot
- **E. rotundifolium* var. *rotundifolium*, round-leaf boneset
- **Galactia volubilis*, downy milk-pea
- **Gnaphalium purpureum*, purple everlasting
- Lechea tenuifolia*, slender pinweed
- **Liatris scariosa* var. *novae-angliae*, New England blazing-star
- **Polygonum erectum*, erect knotweed
- Sagina decumbens*, small-flowered pearlwort
- Solidago rugosa* var. *aspera*, rough goldenrod
- Strophostyles umbellata*, pink wild bean
- **Stylosanthes biflora*, pencil-flower
- Trichostema setaceum*, tiny blue-curls

Immediate Threats

On 16 January 1998, an application to begin development of a significant portion of the Grandifolia Sandhills was filed with officials in the Town of Riverhead. "It is the intention of Traditional Links, LLC to develop [the property] into one or more golf courses and club house, together with a hotel and amenities to create a golf resort," the plans state. "Depending upon the property remaining, a limited number of residential lots may be considered. Thoughts have also been given to the utilization of the shore front for bathing and boating purposes."

It would be tragic to lose this magnificent and unique natural site to development, as has happened in so many other places on Long Island. This is especially so, considering that there are laws on the State books which could protect the Grandifolia Sandhills, treating it as a part of the "Coastal Erosion Hazard Area." There is, in fact, an effort just recently under way to move the DEC into action on this matter (see Hauger *et al.*, 1997), although the outcome is by no means certain.



Save The Sandhills

Once the Grandifolia Sandhills are gone, they are gone forever. Now is the time that action must be taken to save them. You can do much to help the movement to save the Sandhills. For information on how you may join and help the Save The Sandhills campaign please contact me at: Eric Lamont, 717 Sound Shore Road, Riverhead, NY 11901.

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Schlauch, F. C. 1997a. Letter by Frederick C. Schlauch to Theresa Hauger, dated 19 September 1997. Copyright © 1997 by Frederick C. Schlauch. All Rights Reserved. Exhibit H in the Petition of Theresa Hauger *et al.* to John P. Cahill, as Commissioner of the New York State Department of Environmental Conservation, dated 23 September 1997.

Schlauch, F. C. 1997b. Map Showing the Proposed Coastal Zone Erosion Hazard Area Boundary Requested by this Petition. Copyright © 1997 by Frederick C. Schlauch. All Rights Reserved. Exhibit G in the Petition of Theresa Hauger *et al.* to John P. Cahill, as Commissioner of the New York State Department of Environmental Conservation, dated 23 September 1997.

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LONG ISLAND BOTANICAL SOCIETY

Founded: 1986; Incorporated: 1989.

The Long Island Botanical Society is dedicated to the promotion of field botany and a greater understanding of the plants that grow wild on Long Island, New York.

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Membership is open to all, and we welcome new members. Annual dues are \$10. For membership, make your check payable to LONG ISLAND BOTANICAL SOCIETY and mail to: Lois Lindberg, Membership Chairperson, 45 Sandy Hill Road, Oyster Bay, NY 11771-3111

EVENING PROGRAM

12 May 1998 - 7:30 pm*

Dr. Eric Lamont

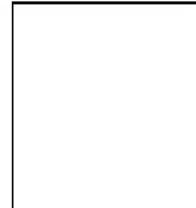
(President, Long Island Botanical Society)

"The Grandifolia Sandhills"

A slide show illustrating the natural landscape features & plant communities of this ecosystem

Location: Museum of L.I. Natural Sciences,
Room 137, SUNY at Stony Brook.

*Refreshments & informal talk begin at 7:30pm, the meeting starts at 8pm. For directions to MOLINS call 516/632-8230



LONG ISLAND BOTANICAL SOCIETY

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